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09/998,519	11/27/2001	Shih-Zheng Kuo	9585-0117	5384

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Stolowitz Ford Cowger LLP
621 SW Morrison St
Suite 600
Portland, OR 97205

EXAMINER	
THOMPSON, JAMES A	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/998,519	Applicant(s) KUO, SHIH-ZHENG	
	Examiner JAMES A. THOMPSON	**Art Unit** 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 14 March 2008.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-24 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 27 November 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 14 March 2008 has been entered.

Response to Arguments

2. Applicant's arguments filed 14 March 2008 have been fully considered but they are not persuasive. Examiner agrees with Applicant that the present amendments to the claims overcome the previously cited prior art references. However, additional prior art has been discovered which renders the presently amended claims obvious to one of ordinary skill in the art at the time of the invention. Accordingly, new prior art rejections are set forth below.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-2, 4, 9-10 and 15-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnson (USPN 5,483,053).**

Regarding claim 1: Johnson discloses a sensing method for a scanner (column 4, lines 61-64 of Johnson), wherein the scanner comprises a motor (figure 2(42) and column 6, lines 42-47 of Johnson) and a charge-coupled device (column 7, lines 3-5 of Johnson), and wherein the charge-coupled device comprises multiple rows of sensors (figures 5-6 and column 7, lines 5-9 of Johnson), the sensing method comprising: moving the motor during an exposure time a distance substantially equal to the width of one row of the sensors at a speed substantially equal to the width divided by the exposure time (column 6, lines 42-47 and lines 62-66 of Johnson – *motor moves in the well-known sweeping scan, which would be at an even speed during the exposure time, and thus a distance substantially equal to the width of one row*

of the sensors at a speed substantially equal to the width divided by the exposure time); and concurrently scanning multiple document portions during the exposure time with the multiple rows of sensors, wherein each of said multiple document portions are not adjacent to any other of said multiple document portions (figure 9(a) and column 9, lines 9-25 of Johnson), wherein each row of sensors is spaced apart from each other row of sensors (figure 6 and column 7, lines 3-9 of Johnson), and wherein the multiple document portions are spaced apart according to spacing between the multiple rows of sensors (figures 9(a)-9(c) and column 9, lines 15-35 of Johnson – *spaced according to width of sensor (resolution) and spacing between sensors (every certain number of lines, such as 6 in example given)*).

Regarding claim 4: Johnson discloses processing and re-sorting a plurality of staggered image signals to obtain a plurality of image data (figures 9a-9c and column 9, lines 25-45 of Johnson – *staggered image signals processed and resorted according to whether native scanning resolution or non-native scanning resolution was used for scanning*).

Regarding claim 9: Johnson discloses an apparatus (figure 1 of Johnson - *other details shown in other figures of Johnson*) comprising means for allowing a scanner to have an increased scan resolution (column 5, lines 52-55 of Johnson – *sampling rate constant, but scan resolution increased by increasing scanning speed based on resolution desired and set by user*), wherein the scanner comprises a motor (figure 2(42) and column 6, lines 42-47 of Johnson) and a charge coupled device (column 7, lines 3-5 of Johnson), and wherein the charge coupled device comprises multiple rows of sensors spaced a distance from each other (figures 5-6 and column 7, lines 5-9 of Johnson), and further wherein the means for allowing comprises: means for moving the motor during an exposure time a distance substantially equal to a width of one row of the sensors at a speed substantially equal to the width divided by the exposure time (column 6, lines 42-47 and lines 62-66 of Johnson – *motor moves in the well-known sweeping scan, which would be at an even speed during the exposure time, and thus a distance substantially equal to the width of one row of the sensors at a speed substantially equal to the width divided by the exposure time*); and means for using the multiple rows of sensors concurrently to scan multiple document portions during the exposure time wherein each of said multiple document portions are not adjacent to any other of said m document portions (figure 9(a) and column 9, lines 9-25 of Johnson), and wherein the multiple document portions are spaced apart from each other according to corresponding spacing between the multiple rows of sensors (figures 9(a)-9(c) and column 9, lines 15-35 of Johnson – *spaced according to width of sensor (resolution) and spacing between sensors (every certain number of lines, such as 6 in example given)*).

Regarding claims 2 and 10: Johnson discloses that the distance between rows of sensors substantially corresponds to a number of times a scan resolution is increased according to the spacing

between the multiple rows of sensors (column 5, lines 52-64 and column 10, lines 2-17 of Johnson – *the desired resolution determines the scan speed and the delay time, and thus the spacing between the multiple rows of sensors as the multiple rows of sensors scan the document*).

Regarding claims 15 and 17: Johnson discloses an apparatus (figure 1 of Johnson – *other details shown in other figures of Johnson*), comprising: means for scanning a first portion of a first scanning region using a first array of sensors (figure 5(34) and column 7, lines 3-9 of Johnson) during a first time period (figures 9b-9c and column 9, lines 56-66 of Johnson – *sensor array scans delayed with respect to each other*); means for scanning a second portion of said first scanning region using a second array of sensors (figure 5(36) and column 7, lines 3-9 of Johnson) during a second time period (figures 9b-9c and column 9, lines 56-66 of Johnson – *sensor array scans delayed with respect to each other*); means for scanning a portion of a second scanning region using the first array of sensors during the second time period (figure 9(a) and column 9, lines 9-16 of Johnson – *arrays of sensors scan different document portions concurrently; when the second array of sensors is scanning the first document portion, the first array of sensors scans a different [second] document portion*), wherein the first and second of the plurality of scanning regions are not adjacent to each other (figure 9(a) and column 9, lines 9-25 of Johnson), wherein the first and second arrays of sensors are spaced apart from each other, and wherein the first and second of the plurality of scanning regions are separated according to spacing between the first and second arrays of sensors (figures 9(a)-9(c) and column 9, lines 15-35 of Johnson – *spaced according to width of sensor (resolution) and spacing between sensors (every certain number of lines, such as 6 in example given)*).

Further regarding claim 15: The method of claim 15 is performed by the apparatus of claim 17.

Regarding claims 16 and 18: Johnson discloses means for sorting data from the first and second arrays of sensors to assemble image data (figures 9a-9c and column 9, lines 25-45 of Johnson – *staggered image signals processed and resorted according to whether native scanning resolution or non-native scanning resolution was used for scanning*).

Regarding claim 19: Johnson discloses a scanning device (figure 1 of Johnson – *other details shown in other figures of Johnson*), comprising: a motor (figure 2(42) and column 6, lines 42-47 of Johnson); a charge coupled device comprising m rows of sensors, wherein each of the m rows of sensors are spaced apart from each other (figures 5-6 and column 7, lines 3-9 of Johnson), wherein the motor is adapted to move, during an exposure time, a distance substantially equal to a width of one of the row of sensors at a speed substantially equal to the width divided by the exposure time (column 6, lines 42-47 and lines 62-66 of Johnson – *motor moves in the well-known sweeping scan, which would be at an even*

speed during the exposure time, and thus a distance substantially equal to the width of one row of the sensors at a speed substantially equal to the width divided by the exposure time), and wherein the m rows of sensors are adapted to concurrently scan m document portions during the exposure time wherein each of the m document portions are not adjacent to any other of said m document portions (figure 9(a) and column 9, lines 9-25 of Johnson), and wherein the m document portions are separated from each other according to corresponding spacing between the m rows of sensors (figures 9(a)-9(c) and column 9, lines 15-35 of Johnson – *spaced according to width of sensor (resolution) and spacing between sensors (every certain number of lines, such as 6 in example given)*).

Regarding claim 20: Johnson discloses that the distance between the rows of sensors is substantially equal to $(x/m)+n$ time the width, wherein x is a positive integer smaller than m, and n is an integer equal to or larger than 0 (*the spacing, such as shown in figures 5 and 6 of Johnson, is a fraction of the width of a row of sensors; thus, n=0 and x equals an integer smaller than m, making the spacing a fraction of the width*).

Regarding claim 21: Johnson discloses a circuit adapted to sort a plurality of staggered image signals from the m rows of sensors (figures 9a-9c and column 9, lines 25-45 of Johnson – *staggered image signals processed and resorted according to whether native scanning resolution or non-native scanning resolution was used for scanning*).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (USPN 5,483,053) in view of Teeter (US Patent 4,451,030).

Regarding claim 3: Johnson does not disclose expressly that the motor comprises a step motor.

Teeter discloses a scanner with sensing elements which are driven by a step motor (figure 3(84) and column 3, lines 49-51 of Teeter).

Johnson is combinable with Teeter because they are from similar problem solving areas, namely the mechanical control of sensing elements in a digital scanner. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use a step motor, as taught by Teeter, in the scanner taught by Johnson. The suggestion for doing so would have been that a step motor is a useful type of motor to control with stepped electrical driving pulses (column 4, lines 46-51 of Teeter). Therefore, it would have been obvious to combine Teeter with Johnson to obtain the invention as specified in claim 3.

7. Claims 5-6, 8 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (USPN 5,483,053) in view of Shimizu (USPN 5,777,308).

Regarding claims 5 and 22: Johnson discloses a scanning device (figure 1 of Johnson – *other details shown in other figures of Johnson*) comprising: a motor (figure 2(42) and column 6, lines 42-47 of Johnson); and a charge-coupled device comprising m rows of sensors, wherein each of the m rows of sensors are spaced apart from each other (figures 5-6 and column 7, lines 5-9 of Johnson), wherein the motor is adapted to move, during an exposure time, a distance substantially equal to a width of one of the rows of sensors at a speed substantially equal to the width divided by the exposure time (column 6, lines 42-47 and lines 62-66 of Johnson – *motor moves in the well-known sweeping scan, which would be at an even speed during the exposure time, and thus a distance substantially equal to the width of one row of the sensors at a speed substantially equal to the width divided by the exposure time*), and wherein the m rows of sensors are adapted to concurrently scan m document portions during the exposure time, wherein each of the m document portions are not adjacent to any other of the m document portions (figure 6 and column 7, lines 3-9 of Johnson), and wherein m document portions are separated from each other according to corresponding spacing between the m rows of sensors (figures 9(a)-9(c) and column 9, lines 15-35 of Johnson – *spaced according to width of sensor (resolution) and spacing between sensors (every certain number of lines, such as 6 in example given)*).

Johnson does not disclose expressly that the distance is substantially equal to $m/(m+1)$ times a width of one of the rows of sensors at a speed substantially equal to $m/(m+1)$ times the width divided by the exposure time.

Shimizu discloses increasing the resolution of a scanner (column 3, lines 9-16 of Shimizu) by sampling at a particular angle (figure 3(42) and column 5, lines 26-28 and lines 39-45 of Shimizu).

Johnson is combinable with Shimizu because they are from the same field of endeavor, namely varying digital image scanner resolution. At the time of the invention, it would have been obvious to a

person of ordinary skill in the art to apply various different angles to increase scanner resolution, as taught by Shimizu. Thus, depending on the value of m for m rows of sensors, a small but non-zero angle would be applied for m rows of sensors to scan during the exposure time, thus obtaining a resolution enhancement of $(m+1)$ for the specified angle. The motor would therefore move a distance equal to $m/(m+1)$ times the width of one row of the sensors. Since the motor moves the sensors at a constant rate during the exposure time, the motor would therefore move a distance equal to $m/(m+1)$ times the width of one row of the sensors at a speed substantially equal to $m/(m+1)$ times the width divided by the exposure time. The suggestion for doing so would have been that the system taught by Shimizu achieves through angled sampling a resolution smaller than a single pixel (column 3, lines 9-15 of Shimizu), thus providing a simple mechanical means to fractionally increase resolution. Further, Johnson is also concerned with increasing resolution based on mechanical spacing, such as shown in figures 9a-9c of Johnson. Therefore, it would have been obvious to combine Shimizu with Johnson to obtain the invention as specified in claims 5 and 22.

Further regarding claim 5: The apparatus of claim 22 performs the method of claim 5.

Further regarding claim 6: For a particularly selected angle for staggering, such as 45° ($\tan^{-1}(1/1)$) or 33.69° ($\tan^{-1}(2/3)$), using the system taught by Johnson as discussed above in the arguments regarding claim 5, the spacing distance between the rows of sensors will be equal to n times the width, wherein n is an integer equal to or larger than 0.

Regarding claim 8: Johnson discloses processing and re-sorting a plurality of staggered image signals to obtain a plurality of image data (figures 9a-9c and column 9, lines 25-45 of Johnson – *staggered image signals processed and resorted according to whether native scanning resolution or non-native scanning resolution was used for scanning*).

Regarding claim 23: Johnson discloses that the distance between the rows of sensors is equal to n times the width, and n is an integer equal to or greater than zero (figure 9(a) and column 9, lines 26-35 of Johnson – *in the example in figure 9(a) of Johnson, each exposure comprises all three sensors scanning a width "w" and separated by a distance of 5 times "w"*).

Regarding claim 24: Johnson discloses a circuit adapted to sort a plurality of staggered image signals from the m rows of sensors (figures 9a-9c and column 9, lines 25-45 of Johnson – *staggered image signals processed and resorted according to whether native scanning resolution or non-native scanning resolution was used for scanning*).

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (USPN 5,483,053) in view of Shimizu (USPN 5,777,308) and Teeter (US Patent 4,451,030).

Regarding claim 7: Johnson in view of Shimizu does not disclose expressly that the motor comprises a step motor.

Teeter discloses a scanner with sensing elements which are driven by a step motor (figure 3(84) and column 3, lines 49-51 of Teeter).

Johnson in view of Shimizu is combinable with Teeter because they are from similar problem solving areas, namely the mechanical control of sensing elements in a digital scanner. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use a step motor, as taught by Teeter, in the scanner taught by Johnson. The suggestion for doing so would have been that a step motor is a useful type of motor to control with stepped electrical driving pulses (column 4, lines 46-51 of Teeter). Therefore, it would have been obvious to combine Teeter with Johnson in view of Shimizu to obtain the invention as specified in claim 7.

9. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (USPN 5,483,053) in view of Boyd (USPN 6,166,831).

Regarding claims 11 and 13: Johnson discloses an apparatus (figure 1 of Johnson – *other figures in Johnson show further details of apparatus*) comprising: means for scanning concurrently a first portion and a second portion of a document using a first row of sensors for the first document portion and a second row of sensors for the second document portion, wherein the first and second document portions are not adjacent to each other (figure 9(a) and column 9, lines 9-25 of Johnson – *multiple rows of sensors concurrently scanning multiple non-adjacent portions of document*), wherein the first and second rows of sensors are spaced apart from each other, and wherein the first and second document portions are separated according to spacing between the first and second rows of sensors (figures 9(a)-9(c) and column 9, lines 15-35 of Johnson – *spaced according to width of sensor (resolution) and spacing between sensors (every certain number of lines, such as 6 in example given)*); means for scanning concurrently a third portion and a fourth portion of a document using the first row of sensors for the third document portion and the second row of sensors for the fourth document portion (figure 9(b); column 7, lines 3-5; and column 9, lines 15-25 of Johnson – *multiple scans required to scan entire document, thus first row of sensors will also scan a third document portion and second row of sensors will scan a fourth document portion; can be as few as two rows of sensors [column 7, lines 3-5 of Johnson]*), wherein the third and fourth document portions are not adjacent to each other (figure 6 and column 7, lines 3-9 of Johnson); and

means for sorting data from the first and second rows of sensors to produce image data (column 9, lines 56 to column 10, line 1 of Johnson – *data sorted using appropriate time delays and then well-known color image data correlations*).

Johnson does not disclose expressly that each of the first and second rows of sensors includes a plurality of sensors to detect three primary colors.

Boyd discloses that two spatially offset, separate rows of CCD sensors can each include a plurality of sensors to detect three primary colors (column 4, lines 16-26 of Boyd).

Johnson and Boyd are combinable because they are from the same field of endeavor, namely altering digital image scanner resolution *via* spatially offsetting the CCD sensors. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include CCD sensors for each of the colors to be scanned on each row of sensors. Such an arrangement would improve upon the overall design of Johnson since the number of sensor rows would no longer be limited to the number of colors to be scanned. Including all colors on each row of CCD sensors would be within the ability of one of ordinary skill in the art at the time of the invention and would have produced predictable results, namely that all three colors (RGB) are scanned and the resolution is increased solely due to physical spacing and movement of the sensors. Therefore, it would have been obvious to combine Boyd with Johnson to obtain the invention as specified in claims 11 and 13.

Further regarding claim 11: The apparatus of claim 13 performs the method of claim 11.

Further regarding claims 12 and 14: Boyd discloses that the first and second rows of sensors are spaced apart from each other at least a distance of one quarter of the width of each of the rows of sensors (figure 4(30b,32b) and column 2, lines 57-64 of Boyd).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
Ichikawa, US PGPub 2002/0030861 A1, Published 14 March 2002, Filed 7 September 2001.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is (571)272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward L. Coles can be reached on 571-272-7402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James A Thompson/
Examiner, Art Unit 2625

27 April 2008